Among the soles this uniformity or monomorphism no longer obtains. In forty-nine individuals of four species of dextral soles, the left nerve is uppermost in 24, the right nerve in 25. Among sinistral soles, or tongue fishes, in 18 individuals of two species, the left nerve is uppermost in 13, the right nerve in 5.

Professor Parker concludes from this evidence that soles are not degenerate flounders, but rather descended from primitive flounders which still retain the demorphic condition as to the position of the optic nerves, a condition still retained by all bony fishes except the flounders.

The lack of symmetry among the flounders lies therefore deeper than the matter of the migration of the eye. The asymmetry of the mouth is an independent trait, but like the migration of the eye, is an adaptation to swimming on the side. Each of the various traits of asymmetry may appear independently of the others.

The development of the monomorphic arrangement in flounders, Professor Parker thinks, can be accounted for by the principle of natural selection. In a side-swimming fish, the fixity of this trait has a mechanical advantage. The unmetamorphosed young of the flounder are not strictly symmetrical, for they possess the monomorphic position of the optic nerve. The reversed examples of various species of flounders (these, by the way, chiefly confined to the California fauna) afford "striking examples of discontinuous variation."

Professor Parker inclines to the opinion that the ancestral flounders were allied to the john dories. This is as plausible a guess as any. They certainly have no affinity with the cod-fishes.

D. S. J.

Notes on Recent Fish Literature.— Mr. C. T. Regan (*Proc. Zoöl. Soc. London*) takes up the osteology of the plectognathous fishes and the classification derived from it. The chief character of the group as distinguishing it from their ancestors, the Acanthuridæ is the absence of ribs. He divides the plectognaths into two divisions, the Sclerodermi and the gymnodontes. To the former group the Ostracodermi are referred. The supposed families of Chonerhinidæ and Tropedechebyidæ are regarded as not distinct from Tetraodontidæ and doubt is thrown on the accuracy of the figures of Hollard which have served as the basis for certain generic distinctions.

The Mexican trigger-fish *Balistes naufragium* is said to be a species of Xanthichthys, a genus rejected by Mr. Regan.

In the *Annals and Magazine of Natural History* (XII, 459–466) Mr. Regan discusses the osteology and classification of the anacanthine or cod-like fishes. He regards the absence of foramen in the hypercoracoid, which separates the cod-fishes from the true jugular fishes (blennies, etc.) as a matter of minor importance, because the same trait is found in several trachinoid fishes, which are true jugular fishes. In the cod-like fishes or Anacanthini, the ventral fins, sometimes many-rayed, are below or in front of the ventrals, "while the pelvic bones are posterior to the clavicular arch to which they are loosely attached by a ligamentous connection." In the true Jugulares the ventrals, with 6 rays or fewer, are jugular, "the pelvic bones being distinctly and firmly attached to the clavicular symphysis."

The true Jugulares are, of course, modified Acanthopteri. In Mr. Regan's opinion "the Gadoids originated from some less specialized stock," their peculiar features being largely primitive. He suggests their possible derivation "from some Haplomous stock from which the Berycidæ have also descended, and of which the Stephanoberycidæ are the nearest living representatives."

In Mr. Regan's view the Macrouridæ are more primitive than the cod-fishes. In this family, Melanomus and Lyconus should be placed. Bregmaceros, wrongly placed near the Brotulidæ, has the general structure of the cod-fishes. Murænolepis is the type of a distinct family. Mr. Regan describes a new genus, Gadomus, based on *Bathygodus longifilis*. In this genus there is a slit behind the last gill, and the hypercoracoid unlike that of all other Anacanthini is perforate. Melanobranchius, another new genus, has the slit behind the last gill, but the hypercoracoid is as in other Macrouri.

In a recent paper (*Ann. Mag. Nat. Hist.*, XI, 372–374) Mr. Regan discusses again the skeleton of *Lervanes imperialis*, deciding finally that it is a highly aberrant scombroid fish.

Dr. Peter J. Schmidt in *Proceedings of the Museum of St. Petersburg* discusses in Russian, and later in German the fauna of the Seas of Japan and Okhotsk. In both these seas the species of fishes are distinctly sub-arctic; although some shore-fishes enter from the ordinary Japanese fauna, these waters are very rich in agonoid and Cottoid fishes, far more so than the corresponding latitudes in the Atlantic. A number of new species are indicated by name, soon to be described.

In the series of monographic reviews of the fishes of Japan, Messrs

Jordan and Fowler (*Proc. U. S. Nat. Mus.*, XXV, 939–956) treat of the fishes known as dragonets, constituting the family of *Callionymidæ*. Of these fishes 12 species are described, and the new species and some of the others are well figured by Captain C. B. Hudson. One species, *Draconetta xenica* constitutes a new family and a new genus, Calliurichthys is proposed for the dragonets with spear-like preopercular spine.

D. S. J.

Häcker's Autonomy of the Germ Nuclei.[1] — This work is in the main an extension of Häckers earlier papers, (1892, 1896) on the autonomy of the male and female pronuclei and of their derivatives in the development of limnetic Copepods. To this central theme he has added two introductory chapters on the ecological (biologische) relations and on the general developmental phenomena of copepods, a chapter on the maturation phenomena of Cyclops and another in which he seeks to extend the idea of the autonomy of the germ nuclei to many classes of plants and animals. These nuclear halves he designates "Gonomeres" while the vesicles formed from individual chromosomes (chromosomal vesicles) he calls "Idiomeres." These names are definite, convenient and really necessary to avoid descriptive phrases and it is desirable that they should come into general use.

The author thinks it is possible to follow this autonomy of the gonomeres from the first to the third generation, but his stages are by no means complete; in fact they consist only of a few cleavage and gastrulation stages and of the developing gonad. His methods of distinguishing the cells of the germ track ("*Keimbahnzellen*") are the following: (1) The autonomy of gonomeres is here preserved longest. (2) Nuclear divisions are here heterotypic, (3) The rhythm of division is here slower than elsewhere, (4) Ectosomes (dark staining granules) are eliminated from the nuclei of the germ track cells, thus suggesting the chromatic diminution of Ascaris. The autonomy of the gonomeres is determined chiefly by the presence of two nucleoli within a nucleus, though in cases where there is a long resting period this number may be reduced to one. Evidently the significance of this is that there are as many nucleoli as there are idiomeres or chromosomal vesicles and when during a long rest-

[1] Häcker, Valentin. *Ueber das Schicksal der elterlichen und grosselterlichen Kernanteile, Morphologische Beiträge zum Ausbau der Vererbungslehre.* Jena. Fischer, 1902. 8vo, pp. 104, 4 plates, 16 text figures.